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Combat Crew

strategic air command

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NOVEMBER 1980

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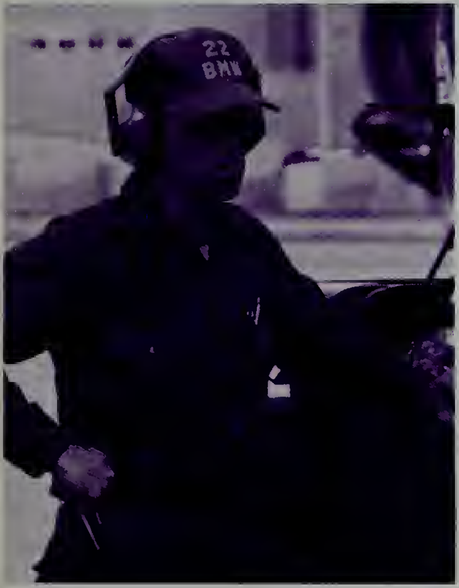

WINTER FLYING HAZARDS

Captain James C St John
HQ SAC/DOWA

The weather phenomenon most often associated with winter is snow. While it is great for skiers and snowmobile enthusiasts, it presents problems for flyers. You all know that snow on runways and taxiways can turn otherwise routine operations like taxiing, taking off, and landing into thrilling experiences. There are some other things about snow that can hurt airplanes, and their crews as well.

Clouds producing snow usually have great potential for heavy icing. These clouds are full of super-cooled water droplets. That is, the water droplet temperature is below 0° C, but are still in the liquid state. If these droplets come in contact with the metallic surface of your aerospace machines, they can freeze instantaneously. To avoid this, avoid the area in a snow producing cloud where the temperatures are just colder than freezing. If you're flying a departure or approach to a base forecasting or reporting snowfall, try to get through this vertical region as quickly as possible.

Another problem is that snow showers can be imbedded in the horizontal cloud decks. These showers don't typically grow as big as during the spring and summer. However, on rare occasions, they will produce lightning. In fact, a few years ago two skiers were riding a chairlift during a snowstorm at a mountain resort in Utah. As their chair passed under a support tower, the tower was struck by lightning. They probably don't ski any more if it's less than "Clear and 15." There is also a potential for electrostatic discharge in these cold cumulus clouds. Turbulence can also be encountered in these snow showers. Snow showers, unlike rain showers can be difficult to detect on radar.

Visibility for takeoff and approach and landing can be a real problem in snow. Small variations in the rate of snowfall can drastically change the visibility. Imbedded snow showers in an area of light snow can drop the visibility from several miles to zero in less than a minute. It is very difficult to forecast visibilities in falling snow. Whenever snow is forecast for your destination, make sure that you have a good alternate. Keep up to date on the situation by checking METRO facilities for latest observations and updated forecasts. And even if your destination is holding above minimums, avoid getting into the situation where landing there is your only option. A subtle change in conditions can put that airfield below minimums very quickly.

Of course there are many hazards waiting to catch the unwary flyer in winter. The winds

WINTER FLYING CHECKLIST

ON THE GROUND

Are you adequately clothed and equipped for the area in which you are flying in or to?

Is the aircraft free of frost or snow?

Are the flight instruments operating properly?

Do you know the complete anti-icing and deicing system of the aircraft?

Do you know how to detect and combat engine icing?

Do you know the correct technique for landing on snow or ice?

What is the correct techique for landing roll on snow or ice?

Are you physically fit?

Do you understand cold weather survival techniques?

Do you double check with the forecaster when weather conditions are marginal?

IN THE AIR

Do you avoid flying into known or forecast areas of freezing precipitation?

Do you obtain frequent enroute weather advisories?

Do you make pilot reports whenever weather is noted to have deteriorated from that forecast?

Do you use all available approach aids?

aloft are stronger in winter and consequently there is more turbulence present, both in extent and intensity. Fog is frequently present along the West Coast and in the South. Freezing precipitation can cause icing on aircraft and runways throughout most of the country. Later in the winter, severe thunderstorm and tornado activity is not uncommon in the Desert Southwest and along the Gulf Coast. Gusty winds behind strong winter cold fronts can and do produce low level wind shear hazards.

The old saying goes "Forewarned is Forearmed," so make sure you get a thorough weather briefing before you fly. During your briefing don't be afraid to ask questions or to ask the forecaster to double check something if it doesn't sound right to you. While you're flying, if your forecast seems to be going sour, call METRO and get an update. Also give a PIREP on any hazards you encounter so that the forecasters can warn the next crew.

The most important thing is to plan ahead and keep options open. What you don't want is to end up having to land in bad weather without an acceptable alternate, especially if you have other problems like fatigue or problems with your aircraft. So fly safely and we'll all be around to enjoy the sunshine next spring.

Combat Crew

Magazine of the Strategic Air Command - 31st Year of Publication

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FLARE

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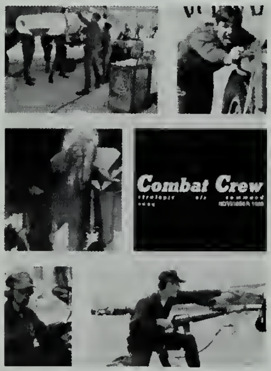

On Our Cover
Action photos of Giant Sword demonstrates just a small part of the activities at Ellsworth AFB early in September.

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Giant Sword

The 97th BMW, Blytheville AFB, walked away with top honors for this year's Giant Sword competition, when the Barrentine Trophy was presented by Maj Gen Pringle to Col Charles W. Bond, commander of the 97th. This marked Blytheville's first win of the coveted award.

Teams from 20 bomb wings arrived at Ellsworth early in September and brought with them the excitement and enthusiasm that characterizes each year's competition. Maj Gen Light, SAC Deputy Chief of Staff for Logistics, opened the competition when he stressed the importance of the duties carried out by the competitors: "The delivery of weapons is what we're all about," he said. "The competition will be tough but so is the mission."

The competition began with written tests and tool box inspections for the munitions teams. By the end of the first day, Pease AFB had taken the early lead with 332 points, one ahead of Grand Forks and Loring, both at 331. Symbolic of the close competition which was to follow, nine units received a perfect score on their equipment inspections.

Although all testing had been accomplished on the first day, the MMS and crew chief tests were not graded until all exercises had been completed. Weapons firing competition by the security teams were also held till last. Since these late scores could well be the determining factor in deciding the winner, it kept the suspense high throughout the competition.

Photos by SSgt James Elia, SSgt Bill Jewell, and SSgt Kevin Sorenson

The second and third days involved a flurry of activity as each unit did its best to establish a strong position for the end of the first round. The bulk of the points, 2260 out of 3000 were to come from two separate exercises by each security team, crew chief, and load team. The teams had to accomplish their graded exercises against the clock. Points were deducted if the time limit was exceeded, if required actions were not accomplished, or if safety violations occurred. Obviously, the first round of exercises set the pace for the following and deciding round.

The weapon loading exercise began as the crew chief performed his preload exam. Each was allowed a set time to accomplish the tasks required and the evaluator was ready to catch any mistake, no matter how small. Although the exercise was a demanding one, five crew chiefs completed the preload competition with the maximum number of points possible. They represented Carswell, Robins, Dyess, Blytheville and Griffiss.

Upon completion of the crew chief exercise, the MMS loading team was ready for their weapons loading. The team chief first briefed his team on safety items and tasks and upon his command, the team moved into action.

Only minutes were allowed for the team to complete the loading exercise. Team work was essential and every member of the team had specific required actions to accomplish, each of which had to be accomplished in proper sequence. After the first round of competition was over, Ellsworth, Wurtsmith, Plattsburgh, K. I. Sawyer and Pease had achieved a perfect load.

The first round security police exercises were open to all spectators this year. In the past, both of their exercises had been closed to protect the scenario and prevent any team from gaining an undue advantage. At the end of round one, K. I. Sawyer emerged as the overall points leader. Although Sawyer was never first in any of the individual competitions, their overall effort put them first overall in the standings.

First place for the munitions loading was shared by Plattsburgh and Pease, each with perfect scores in the loading exercise and equipment inspection. There was also a five way tie for best overall crew chief as mentioned previously.

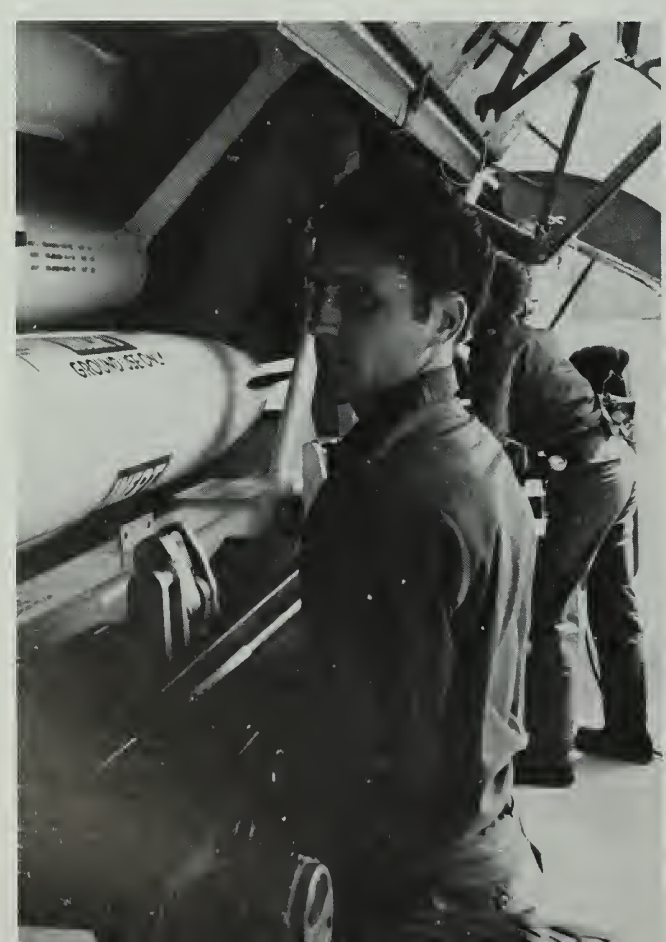
Seymour Johnson captured the first round lead for the security police competition with 665 out of 700 points but Loring and Carswell were close behind at 657 and 650 points respectively.

In round two, it looked like the loading competition would be a race between Pease and Plattsburgh since each had a perfect score going into the second round. Plattsburgh accomplished their second loading first and again achieved a perfect 550 points. This placed pressure on the Pease crew but they were up to the task and demonstrated their proficiency by also posting their second perfect score.

The second round for crew chief's was a post-load exercise and again there was a close race for top honors. The six crew chiefs from Barksdale, Ellsworth, Blytheville, Mather, Wurtsmith and Griffiss all received a perfect score.

Sgt Karl S. Warren from Griffiss and Sgt Kevin W. McCullough from Blytheville repeated their top performance from the first round and were tied in the overall point total with a perfect score.

The second security team exercise was closed except to specially cleared spectators. The scenario was the same for all units and closed sessions were necessary to insure confidentiality. To further guard against giving away secrets the teams were scheduled in descending order determined from their first round showings. The exercise was conducted as realistically as possible and involved a simulated attempt by terrorists to take over an alert aircraft. The attack and the swift action which followed gave one a sense of the constant awareness that must be maintained by our security forces during their everyday routine. The Carswell team posted the best combined score for the two exercises with 911 points.



On the final day of competition, the missing MMS test scores were given first. When the last score was in place, Pease's test score was seven points higher than Plattsburgh's and the team of SSgt Robert Bell, SSgt Paul R. Sasonburg, SrA Jeffery Mazowieski, SrA Jeffery Hogg, Sgt Todd McGin and Sgt Rolf Marchant took the trophy for best load team.

As the scores proceeded down the board, the trophy for best crew chief was up for grabs and was within reach of the top 10 crew chiefs, but SSgt Warren from Griffiss finished first overall, 1.25 points ahead of Blytheville's Sgt McCullough. Finally, the security team scores were posted and decided the winner of this year's Barrentine Trophy. A strong showing by Blytheville's security team won them the team trophy. Team members were: SSgt James Williams, SrA Bruce Hayden, SrA George Benefield, SrA Robert Morris, SrA Anthony Coleman, and Sgt Robert Boss.

As always there were no losers in the competition—each person brought something away as valuable as a trophy. It is not a tangible that can be placed in a case but rather a regeneration of the spirit of competition and a sense of team work. The spirit of the competition is symbolized by the Spirit Bell trophy. This year's presentation was voted to go to the team from Fairchild AFB by their fellow competitors. Next year will see new teams and new faces but the goals and the desire to excel will not change. Each team member will again play his part in the selection of the best of the best.

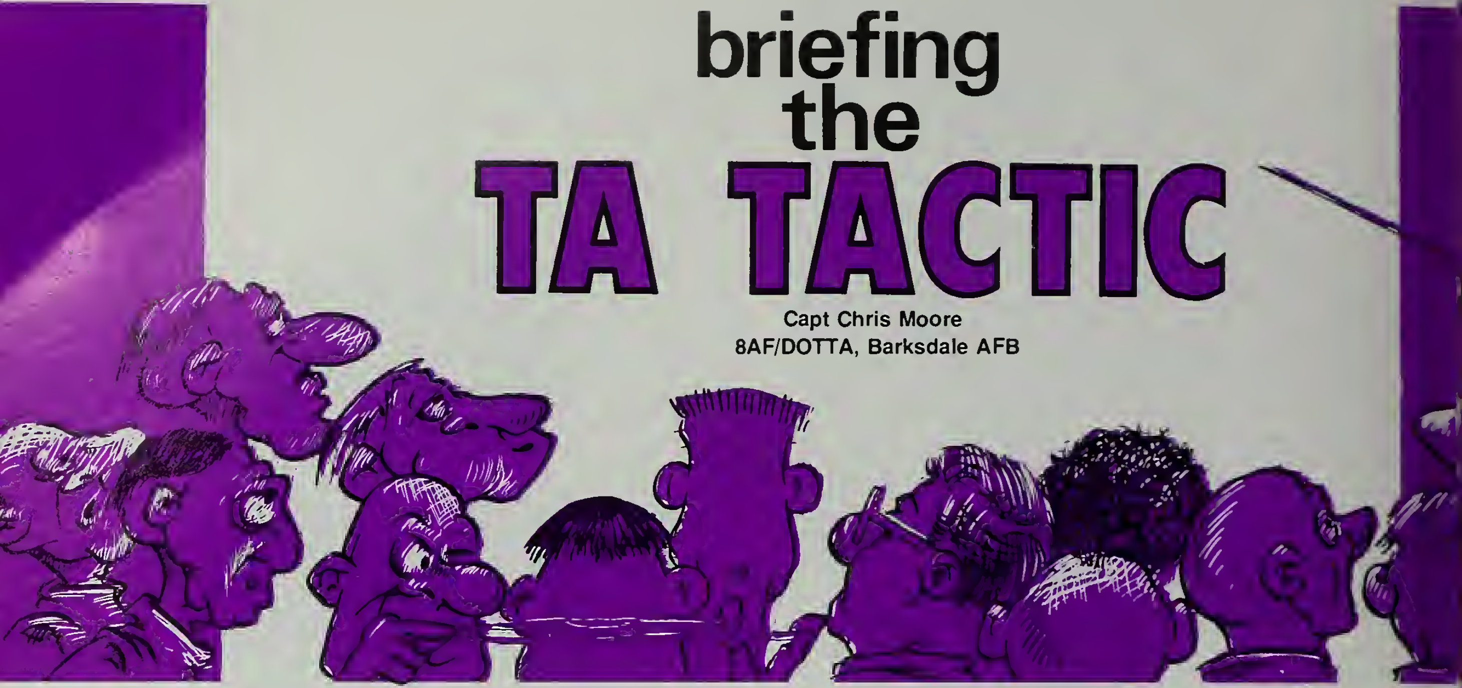
Lt Gen Mullins, commander 15AF, emphasized during the awards banquet that "each and every team throughout SAC was competing daily to insure the readiness of the command." The competitive spirit honed by this competition and the knowledge gained must be carried back home if the full value of Giant Sword is to be realized.

The Winners

Barrentine Trophy	
Blytheville	97 BMW
Best Security Police Team	
Blytheville	97 BMW
Best Munitions Load Team	
Pease	509 BMW
Best Crew Chief	
Griffiss	416 BMW
Best Munitions Load (combined)	
Pease	509 BMW
Best FB-111 Load	
Pease	509 BMW
Best B-52 Load	
Blytheville	97 BMW
Best Crew Chief Preload	
Blytheville	97 BMW
Best Short Range Attack Missile Load	
Blytheville	97 BMW
Best Munitions Equipment	
Carswell	7 BMW
Best Munitions Testing	
Carswell	7 BMW
Best Security Police Exercise	
Carswell	7 BMW
Best Security Police Marksman	
Pease	509 BMW
Best Security Police Test	
Loring	28 BMW
Best Crew Chief Test (shared)	
March	22 BMW
Dyess	96 BMW
Spirit Bell Trophy	
Fairchild	92 BMW

briefing the TA TACTIC

Capt Chris Moore
8AF/DOTTA, Barksdale AFB



Inflight crew coordination can be smoothed out by a thorough premission briefing. In addition to those items covered by SACR 50-12, determine where checklists for both the offensive team and the pilots will be run.

If necessary rehearse turn coordination procedures. For instance:

NN. "Crew, information foxtrot: 157 degrees, two and one-half minutes, three thousand."
CP. "Crosschecked and cleared visually."
RN. "High terrain, two o'clock, two miles, on radar."
NN. "Pilot, right turn 157, NOW."

This type of communication is clear, easily interpreted and brief.

Discuss additional communication and feedback between the pilot and the radar navigator which is essential to flying safety and effective TA flight. Terrain calls at ranges greater than 10 miles are of little use, since the pilot's longest range gate is 10 miles. Unless route analysis and aircraft performance dictate a climb point in excess of 10 miles from a terrain feature, delay the call until the terrain is within 10 miles. When terrain is called at 10 miles, the pilot should switch to PRO 10 and correlate the trace and the EVS. Then the pilot should use some exact terminology to communicate what he sees to the radar navigator. Saying, "I've got it" may mean he sees it through the window (impossible in a closed curtain environment) or that he just took control of the aircraft from the copilot, or that he sees something that the safety observer has pointed out to him. If mutually acceptable terms are agreed upon, communications can be brief, yet precise. For example: "PRO 10 high trace, right" may be used to say, "I have switched to profile 10, and the terrain trace extends above the HRL, right of centerline." Or "Video impact, center" may be used to say, "the terrain trace is coincident with the HRL, however, the intersection of the fiducial marks on the EVS scope coincides with a terrain feature shown on the scope." Whatever expressions are used should be simple to say and understand, and employ exact terminology to avoid confusion.

Agree on high terrain START CLIMB points and terms. If aircraft gross weight or other performance considerations dictate a start climb point outside the pilot's range gate, the RN might initiate it by saying, "Pilot, high terrain 12 o'clock, 13 miles. Start 8° climb, 9280′ , NOW." The pitch attitude is determined from aircraft performance; the target altitude from route analysis.

Tell the offense team when you want them to give you an MSL altitude to level off at when the radar altimeter or terrain trace may be unreliable or inoperative, or before calibration of the set has been completed. This is particularly helpful when the aircraft is above 1000′ AGL and will avoid "descending visually," a loose phrase that means, "I have quit using the system and am flying by the seat of my pants." It keeps things from being vague.

Discuss use of the navaids, and position of the instrument control switch with the copilot. Have the TACAN and VOR continually updated to a nearby station. I suggest setting the

The third in our series of TA/EVS tips.

radial for the next action point in the course window, and setting the heading marker on the flight plan heading. If FCI is to be used, place the heading select switch to normal and have the navigator engage the EVS BNS HDG switch. If flight plan headings are to be flown, place the heading select switch in manual with the EVS BNS HDG switch disengaged. During bomb runs, it is often helpful to put the planned bomb run heading in the course window with the heading select switch in normal for synch runs, and to use manual heading mode for alternate runs, updating the heading marker continually during the bomb run. The instrument control switch should be positioned for the pilot flying the aircraft, unless the pilot not flying the aircraft is changing the display. These procedures will keep meaningful information on the HSI and EVS displays.

Specify who will handle power and maintain airspeed for the different segments of the route, particularly if the pilot not flying the aircraft will have speed control. This will keep you from fighting with each other by taking out corrections the other pilot has just put in. Discuss fuel flows for each airspeed, and power settings for climbs over high terrain, as well as airbrake configuration for descents.

Discuss visual clearing procedures and safety observer responsibilities. The pilot flying the aircraft should use outside references when the pilot not flying must crosscheck navigation information, make a STR call in, or is otherwise distracted from clearing the aircraft visually. Insure that the safety observer does not get so involved with visual bomb run timing points that he neglects to clear for other aircraft. Knowing that someone is always watching outside the airplane will allow the pilot flying the airplane to generally stick to the TA scope and instrument references with confidence.

The offense team should determine who will be navigating when navigation is often neglected during the TA calibration, bomb run post release, offense checklists, and route exit. Pilots should determine who will be flying when, and provide TA training opportunities for both pilots.

Discuss the bomb run and contingencies in detail. Again, be sure to use exact terminology. The radar navigator should specify any part of the bomb run he is giving away: "Navigator, you have the timing," or "Copilot, you have the heading," is more meaningful than "You have it." Study the Air Target Chart for significant terrain that will affect the TA tactic, and do not let clearance altitude become random during the bomb run. Discuss the pitch attitude to be used for the PUP, and PUP countdown procedures.

Lastly, brief for the unexpected. Discuss what will be done if the terrain trace is unreliable, the radar altimeter is inoperative, or other equipment failures occur. (SACR 50-4 provides guidance.) This will keep everyone from guessing what to do should malfunctions occur in flight. A preplanned course of action for weather avoidance and aircraft system malfunctions during the TA tactic is of special importance. "Maintain safe terrain clearance" should parallel "maintain aircraft control" when emergencies occur at low level.

Major Ed Maerz
93BMW/CFIC
Castle AFB, CA

DON'T BECOME A STATISTIC

Our primary mission in SAC is deterrence. We in the flying business have our entire EWO mission bet on the low level penetration of our bomber force. Do you feel you can actually make it with your present level of proficiency? Let's take a look at what you're going to be up against. First of all, low level in an EWO environment will be considerably different than our normal training routes. You will be down lower, regardless of the weather, and going a lot faster. There is a probability of AAA, SAMS, fighters and possibly all three, not to mention possible increased turbulence and weapon effects. Fatigue could also be a major factor.

Our Red Flag and Maple Flag missions give us a golden opportunity to fly at a more realistic altitude in a simulated wartime environment. They give us the opportunity to practice flying lower and faster. Some of you who have flown these missions have really taken advantage of that opportunity. In fact, you may have become a little over-zealous in your efforts. We've all heard the stories—sometimes they're slightly exaggerated, but we keep hearing them just the same. It sounds good at the bar when you tell the guys you were 50 feet off the deck and well below an F-15 that was up at 200 feet, or maybe that the radar altimeter was reading zero for a few minutes, or that the only way the fighter could find you was because of the rooster tail of sand being blown up behind your engines.

We all have a certain pride in our airmanship and it goes back a long way. The barnstormers probably started it all, and there have been countless examples since. During World War II, Richard Bong looped his P-38 around the Golden Gate Bridge and followed it up with a 400 MPH trip down Market Street in San Francisco. There are countless regulations, and a more professional attitude which prevent that type of activity today, and we don't know of anyone who would try that maneuver in a B-52 anyway (at least not the loop). However, a Red Flag mission can give you a chance to see what can be done at low altitude. But, before doing so, you should be aware of certain problems that exist within the aircraft systems.

A recent B-52 mishap pointed out the need to review some problems associated with low level flying and terrain avoidance related equipment. Before you fly with that radar altimeter reading zero, let's take a closer look at how it works and its tolerance for error. The AN/APN-150 radar altimeter is the same instrument that was installed in the B-52 in 1963. It consists primarily of four major black box assemblies. The one that most concerns pilots is the height indicator. It measures absolute altitude from 40-50,000 feet within ±5 percent tolerance so long as the aircraft does not exceed 25′ of pitch and 30° roll. The altitude of the aircraft above the ground is determined by the time it takes a transmitted signal to reach the ground and be reflected back to the receiving system. The transmitted signal that is radiated is a 60 degree wide beam aimed toward the ground. When this energy beam is transmitted over rough terrain (hills, valleys, etc.) samples are reflected back to the aircraft in varying amounts from any object within the beam width. Since multiple altitude readings cannot exist simultaneously, the AN/APN-150 weighs all samples and reaches a statistical average altitude. The indicated radar altitude is an average of all instantaneous readings and is only representative of the entire beam width. A similar averaging procedure occurs during bank maneuvers where the area scanned by the antenna is extended in one direction and retracted in the other. At bank angles greater than 30 degrees the 60 degree beam will extend further from the aircraft causing erroneous altitude indica-

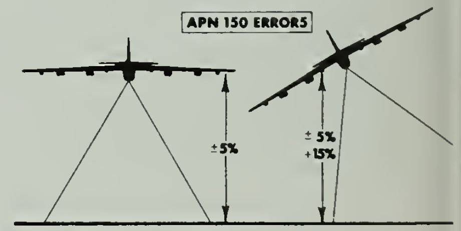


Figure 1

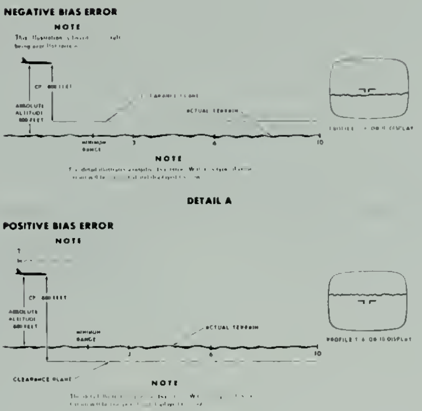


Figure 2

tions of approximately 15 percent higher than actual. If the bank angle is steep enough, it is conceivable that the 60 degree beam could actually be above the horizon. The radar altimeter would then be computing the statistical average of some terrain and infinity. Basically if the aircraft exceeds 30 degrees of bank, the AN/APN-150 becomes unreliable.

If we combine the 5 percent tolerance and the 15 percent error that you could have in 30 degrees of bank, your total AN/APN-150 error while flying at 200 feet above the ground may amount to 40 feet. See Fig. 1. That may not seem too significant, but while you were in that bank you momentarily deviated to 33 degrees of bank and the low level mode of the autopilot disengaged just like the book says it will. In the confusion you allow the aircraft to continue to roll to 40 degrees of bank. Now approximately 75 pounds of back pressure is required to maintain level flight. You are a little slow with the back pressure so you lose 50 feet. Still, no problem, because you have safe terrain clearance and you're well within Highly Qualified standards. (After all, anybody who can do a steep turn and maintain their altitude within 50 feet is doing pretty good . . .). While we're in that bank, let's look at that 185 foot wing span on our loveable old behemoth. Bank angles of 15 degrees, 30 degrees and 40 degrees put that wing tip at 16 feet, 40 feet and 54 feet respectively below the fuselage. Those measurements include calculations for wing flex on a 300,000 pound B-52H. Airspeed will change these values, but not by an appreciable amount. Now back to our hypothetical situation. Those seemingly insignificant 40 and 50 feet figures have now reduced our 200 foot terrain clearance by 144 feet. Remember, if you are flying over forests, the radar altimeter paints the ground not the tree tops. Throw in some of those trees, a radio antenna, telephone pole, a small hill or some other obstruction, and you can become a statistic in something less than 15 seconds.

Now, let's consider the 200 foot minimum clearance plane setting for the B-52 terrain avoidance system. Why the restriction? The first and most obvious answer is that a clearance plane set to less than 200 feet negates the warning function. That is, since the Terrain Avoidance warning light illuminates at settings less than 200 feet, the light will already be illuminated and an actual problem will not be apparent. The 200 foot margin is a safety factor for shifting accuracy in the servos and computers. The margin is built into the Terrain Avoidance computer for design parameters. Without this, there would be no room for errors and corrections by either the equipment or the flight crew. The 200 foot figure then, is not an arbitrary number, but one with a purpose, and an important one at that. Because, when we insert a very common error into the system, we can limit our capabilities substantially.

Let's briefly review bias and tilt errors and their effect on our terrain clearance. Bias error is essentially the same magnitude at all ranges. Tilt error increases with range. These errors may be either negative or positive. A positive error will cause the flight path to be higher above the terrain than desired because the terrain is computed erroneously high and a negative error will cause the flight path to be closer to the terrain than desired because the terrain is computed erroneously low. (See Fig. 2). Compensation for negative bias error is easily applied by increasing the clearance plane setting by the amount of the error. With positive bias error in the Terrain Avoidance system, the terrain trace would appear above the horizontal reference line (HRL) when the clearance plane setting is equal to absolute altitude. A positive bias error is compensated for by decreasing the clearance plane setting; however, to allow a reasonable safety margin, the clearaace plane setting is decreased by only one-half of the error.

Now, let's look at what that means in numbers. Suppose you are flying a B-52 at 800 feet and your terrain trace is above the HRL, so you have a positive bias error. In order to make the terrain trace coincident with the HRL you must decrease the clearance plane to 600 feet, which is your final CP setting. No problem at all, as long as you are going to fly above 400 feet. On the other hand, if you had planned on flying at 200 feet you would now have to set the clearance plane to zero, which negates the failure warning circuits. You have to choose between flying without the built-in safety features of the system, or flying at an altitude (in this case 400 feet) which may reduce your terrain masking. The point is that positive bias errors can dramatically reduce your capability to fly low. Obviously, it is vital that errors in

Continued on page 27

What's the weather?

1Lt Lorraine Yashinski
DET 4, 26WEA Loring AFB

"It is three o'clock in the morning . . . thoughts of weather over Newfoundland cloud my mind as I drive towards Base Ops . . . the weather for Coronet East looked good last night . . . hope it holds up."

No, I'm not a pilot or a navigator. I'm not even a crew member, but I *am* a member of the "crew" which helps to define conditions and problems associated with every mission we fly.

Up here at Loring, its logical that we be tasked to support deployment of aircraft over the mighty North Atlantic. We give fuel and a fond farewell to fighters destined east or a hearty welcome to fighters returning home. It's an interesting and sometimes difficult mission for weather people to support because of the length of the trip over the Atlantic and the sparsity of data. When Charles Lindbergh flew the Great Circle Route to reach Paris back in 1927,

he ran into many of the same problems we have today: fog, icing and low clouds. Of course, his flight level was much lower than that of our operations today, but the influence of weather factors over the North Atlantic is still the same. But we have help! Satellites take pictures of the North Atlantic. People and computers can judge the approximate height of the cirrus by measurements of reflectivity off these clouds. The clouds can be progged by looking at their history over the continent, how large and high they were, the hazards inherent in them and their possible configuration and path. But the Atlantic Ocean modifies the system, as does all bodies of water, fueling it by its extensive heat supply, or sometimes acting as a graveyard for systems that have expended all their energy over land. All in all, weather and hazards across the ocean are crucial. There is a lot of water down there and alternate bases are few and far apart.

As a weather officer, I've briefed weather for many of these missions, but a few weeks ago I decided to take it one step further. Brief the mission, fly with the crew, and see what is actually out there. I hoped not to find any surprises different from the forecast!

The briefing was scheduled for 0700L though our preparation began three hours prior to that. We used weather prognoses and upper air wind progs provided by Global Weather Central and forecasts devised by the TAC Weather Support Unit to help us plan a briefing and weather package to give to the tanker crews flying Coronet East. It looked like the main part of the low pressure system would be to the south of our route and that we would not encounter clouds for either of our air refuelings. The wind flow at our flight level was forecast to undergo tight curvature over Nova Scotia so turbulence due to directional shear was probable. All the thunderstorm activity looked to be south of the route, around the frontal boundaries. Both Goosebay and Gander were forecast to have VFR conditions, so our alternates were okay. All the reasoning, forecasts and coordination was then transferred onto overhead slides.

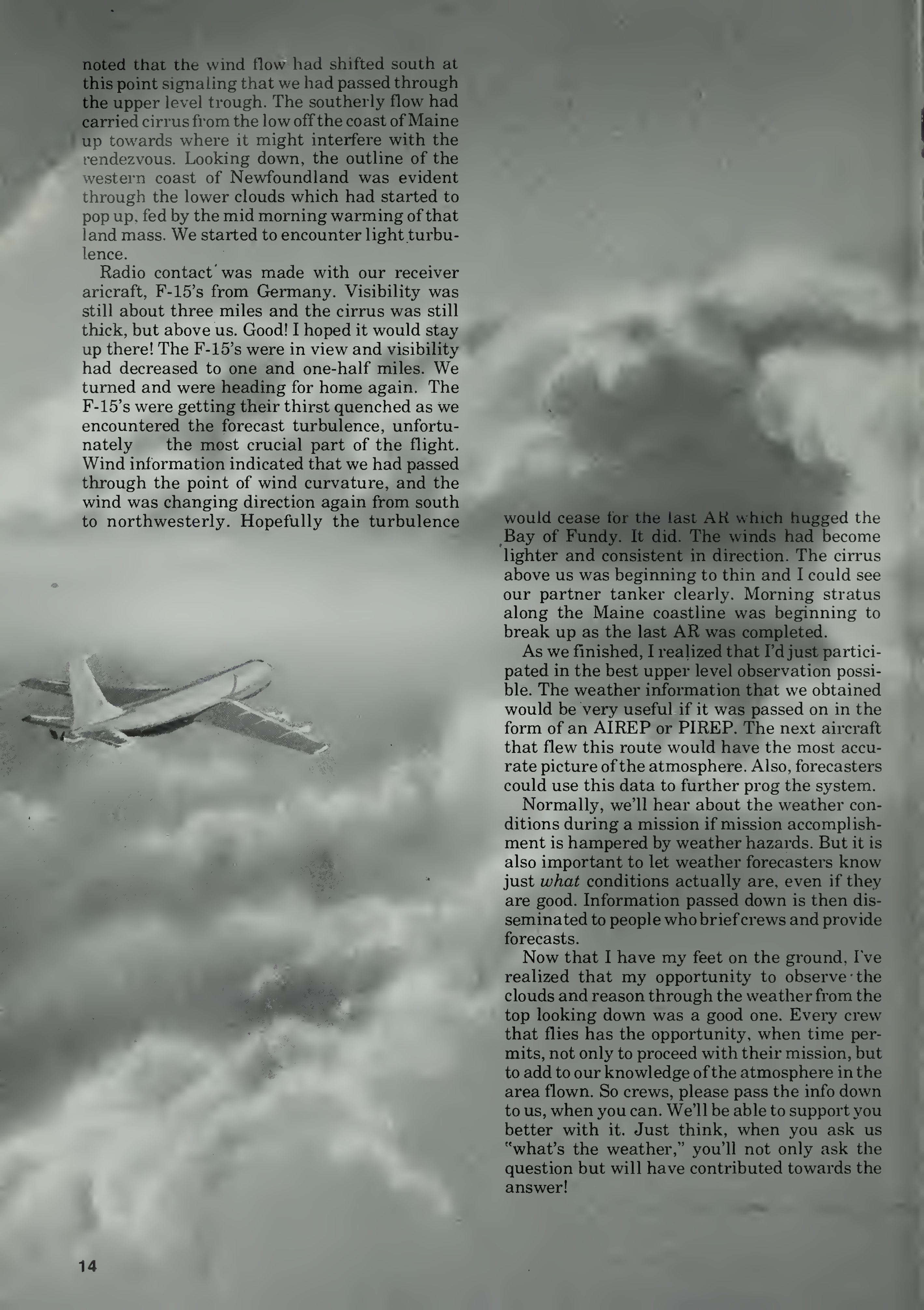
The crews arrived just as we finished preparation of the slides for the overhead projector. They seemed glad to have me on board, mostly because if conditions weren't as I briefed, I'd be present for immediate criticism or comment! We took off at 1100L and I rode in the lead KC-135. Actual take-off conditions were close enough to forecast so the copilot's take-off computations were within limits.

During departure my eyes were fixed on the clouds with an occasional peek at our altitude. Scattered altocumulus was present in all quadrants with some cumulus buildups perking to the south. Good so far—we expected the clouds to be building towards the south. When over Chatham, I could see that the eastern horizon was obscured by clouds and the St. Lawrence Gulf was developing an undercast of stratus. Approaching Port aux Besques on the southern coast of Newfoundland we had the first surprise—cirrus clouds above us, getting thicker. Unforecast! I had briefed cirrus up to 20,000 and here was a layer beginning at 280! Why? Its easy to say in hindsight and with the help of the observation system aboard the aircraft, as the nav read wind and position off the INS. After seeing what an aid it can be I understood why the nav cheered as he saw the INS during preflight that morning.

We plotted the information obtained and

noted that the wind flow had shifted south at this point signaling that we had passed through the upper level trough. The southerly flow had carried cirrus from the low off the coast of Maine up towards where it might interfere with the rendezvous. Looking down, the outline of the western coast of Newfoundland was evident through the lower clouds which had started to pop up, fed by the mid morning warming of that land mass. We started to encounter light turbulence.

Radio contact was made with our receiver aricraft, F-15's from Germany. Visibility was still about three miles and the cirrus was still thick, but above us. Good! I hoped it would stay up there! The F-15's were in view and visibility had decreased to one and one-half miles. We turned and were heading for home again. The F-15's were getting their thirst quenched as we encountered the forecast turbulence, unfortunately the most crucial part of the flight. Wind information indicated that we had passed through the point of wind curvature, and the wind was changing direction again from south to northwesterly. Hopefully the turbulence would cease for the last AR which hugged the Bay of Fundy. It did. The winds had become lighter and consistent in direction. The cirrus above us was beginning to thin and I could see our partner tanker clearly. Morning stratus along the Maine coastline was beginning to break up as the last AR was completed.



As we finished, I realized that I'd just participated in the best upper level observation possible. The weather information that we obtained would be very useful if it was passed on in the form of an AIREP or PIREP. The next aircraft that flew this route would have the most accurate picture of the atmosphere. Also, forecasters could use this data to further prog the system.

Normally, we'll hear about the weather conditions during a mission if mission accomplishment is hampered by weather hazards. But it is also important to let weather forecasters know just *what* conditions actually are, even if they are good. Information passed down is then disseminated to people who brief crews and provide forecasts.

Now that I have my feet on the ground, I've realized that my opportunity to observe the clouds and reason through the weather from the top looking down was a good one. Every crew that flies has the opportunity, when time permits, not only to proceed with their mission, but to add to our knowledge of the atmosphere in the area flown. So crews, please pass the info down to us, when you can. We'll be able to support you better with it. Just think, when you ask us "what's the weather," you'll not only ask the question but will have contributed towards the answer!

HQ/SAC — DIRECTORATE OF AERONAUTICAL REQUIREMENTS

r&d corner

OAS
BOEING
OFFENSIVE AVIONICS
SYSTEM

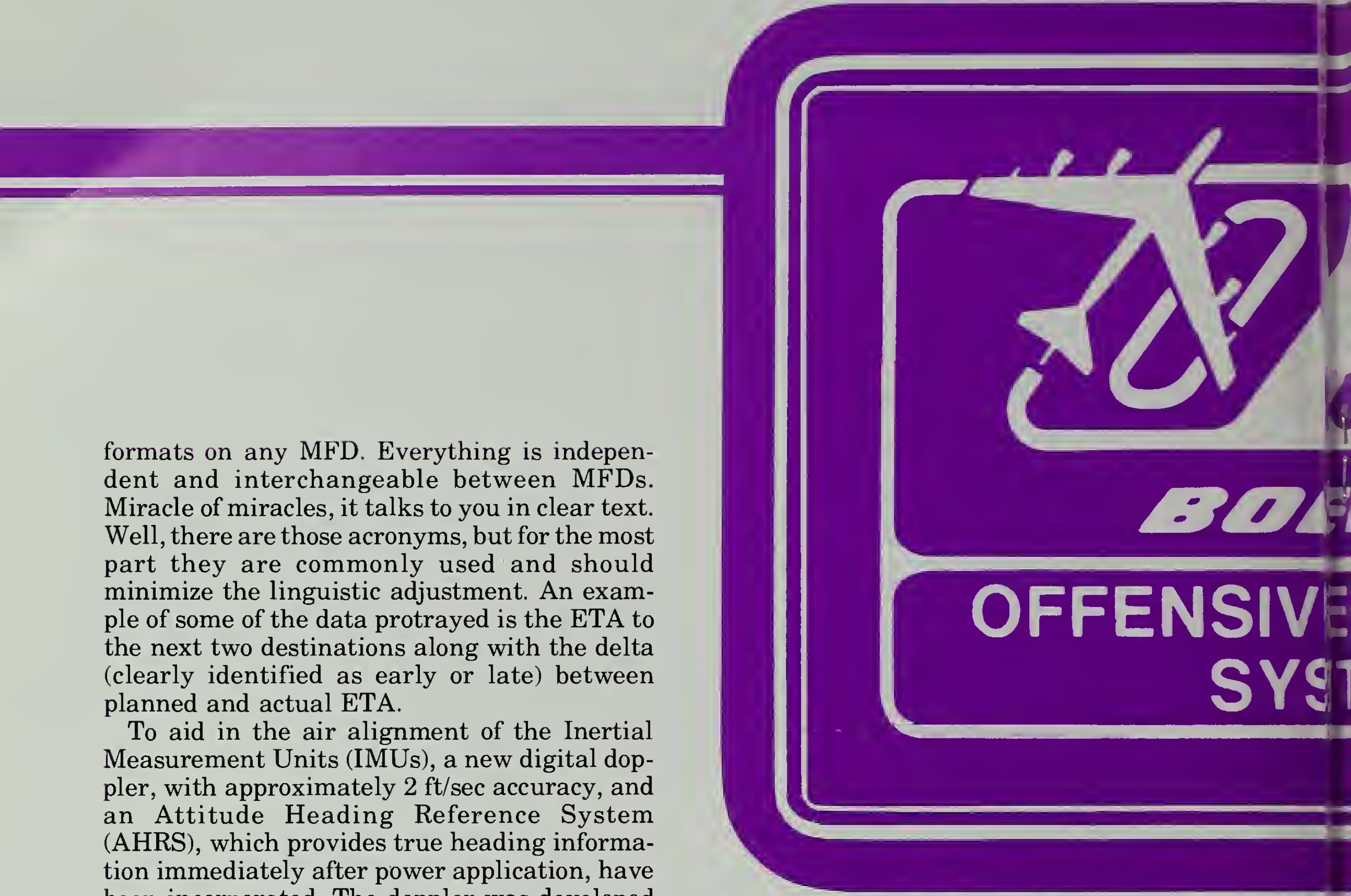
B-52G/H MODERNIZATION
OFFENSIVE AVIONICS SYSTEM (OAS)

Major Jerry Patterson, XPHN, and
Major Mike Stewart, XOBB

The B-52 has been operationally deployed for over twenty years and during this time numerous modifications have been made to improve its performance. The current bomb/nav configuration, with its penchant for going "bananas" at precisely the wrong time, has been plaguing RNs and NAVs since its inception. It's been a few years since we've had to earn our flight pay, but we still remember those embarrassing little questions from up front, asking why the TTG was running backward, or why the elapsed time from the TIP was 45 seconds in error. Suitable answers were difficult to come by then and we assume that aspect of the bomb/nav game has not changed.

After twenty-plus years of unexplainable malfunctions and mental abuse from the ASQ-38 Bomb/Nav System, SAC is providing relief in the form of the Offensive Avionics System (OAS) modernization program for the B-52G/H. The improvement that will be achieved by OAS is in the areas of accuracy, reliability, crew workload and system integration and will be a giant step into the twentieth century for bomb/nav teams.

The heart of the OAS is two digital IBM 101C-series computers that accomplish all those mundane tasks, such as ETAs, early or late computations, and ballistic determinations. What happens if one fails? Nothing, as each is capable of performing by itself with no degrade to the mission. To provide the answer to that proverbial question confronting all navigators, "Where am I?", there are two inertial navigation systems, each operating independently, going under the name of SPN/GEANS, produced by Honeywell. The specification accuracy, verified by flight tests, is a drift rate of .1 NM/HR with ground alignment and .3 NM/HR after air alignment. That should do wonders for the "quaffing of the bitter cup" that B-52 crews have experienced from the FB troops during Bomb Comp. To relay all this accuracy and information to the navigator team, an arrangement of four (two at each station) multiple function displays (MFDs) have been provided with separate controls. This will permit any combination of available formats or cycling of



formats on any MFD. Everything is independent and interchangeable between MFDs. Miracle of miracles, it talks to you in clear text. Well, there are those acronyms, but for the most part they are commonly used and should minimize the linguistic adjustment. An example of some of the data protrayed is the ETA to the next two destinations along with the delta (clearly identified as early or late) between planned and actual ETA.

To aid in the air alignment of the Inertial Measurement Units (IMUs), a new digital doppler, with approximately 2 ft/sec accuracy, and an Attitude Heading Reference System (AHRS), which provides true heading information immediately after power application, have been incorporated. The doppler was developed under the name "Common Strategic Doppler" and will be deployed in current and future strategic aircraft. The AHRS is a highly reliable off-the-shelf piece of equipment that is currently being used in the A-10 and C-141.

There's no need to worry about maintaining straight-and-level flight during the air alignment routine. Coarse/fine alignment of the inertial units begins at power application and continues during takeoff and climbout. As with most inertial platforms, the time required is dependent upon system temperature. In any case, the system will inform the operator, again in clear text, that it's ready to accept a position update. At this point, either operator can accomplish the radar fix update, after checking system altitude and refining crosshair position, by depressing one of the three fix update buttons on the RN Management Panel. The selected IMU is now providing the navigation information to the system, with the non-selected IMU operating independently as a back-up.

Another major modification to the B-52 under the OAS program is to the radar. Although the purpose of this modification is to improve reliability, a natural fallout is an increase in performance. The Modified Advanced Capability Radar (MACR) provides both an increase in reliability and accuracy. This program will replace all of the current radar components except for the antenna and terrain avoidance computer. Norden Systems is responsible for the Radar Transmitter Modulator (RTM) which combines all the radar functions and performance characteristics into one black box. Sperry Rand designed the digital scan converter and the controls and displays. The overall result is a digital radar presentation that improves the resolution and provides several unique modes to the operator. These modes are the standard PPI, a displaced center PPI, a spot size which imitates the current off center mode except that the display is a patch of selected range around the crosshairs, and a freezer mode that literally takes a snapshot of desired presentation. This will permit the operator to perform his RSI and crosshair refinement at ground speed zero, just like the critics in the Bomb Nav shop do with the 0-32 film. Any corrections to the crosshairs in the freeze mode will be adjusted for lapsed time automatically by the system. Other features of

the system, which will produce increased reliability and accuracy of the radar, are unlimited crosshair range, continuous steering information to the next destination, automatic sequencing of destinations, and automatic sequencing of preselected RFPs in such a manner that the crosshairs are always tracking a known return. These features reduce the time required to perform basic navigation functions, thus providing more time for system management and RSI.

Information required to make the OAS work, is provided by four tape cassettes. One contains the Operational Computation Program (OCP), the basic software for the two IBM processors. Another records critical data, such as malfunctions, system updates, weapon release, etc, for maintenance and operations postflight analysis. The remaining two contain the "flight plan" for the B-52 and Air Launched Cruise Missile (ALCM). A Mission Data Preparation System (MDPS) is being designed by Boeing to program these cassettes with the appropriate data for each mission. The hardware consists of a processor, disc storage, 9-track tape drive, CRTs, line printers, and an integrated keyboard. To create EWO missions, both B-52 and ALCM, all the information will be provided by HQ SAC via 9-track magnetic tape with the exception of B-52 departure routing, RFPs, and offsets. These will be determined by wing personnel and merged onto the cassette. Daily training missions will be created by wing personnel. To assist in this task, the MDPS has the ability to store and merge segments such as low level routes, air refueling areas, departures, etc. It also will compute wind and fuel usage flight plans from point-to-point inputs by the operator. All required hard copy documents of the mission will be extracted, formated, and printed automatically from operator inputs. The design of the MDPS and its storage capacity plus the fact that five separate B-52 missions can be stored on one Digital Transfer Unit Cassette (DTUC), each mission will contain up to 100 destinations and 140 RFPs/offsets, provides a great deal of flexibility to the unit planner.

The foregoing description is only a thumbnail sketch of the many new capabilities that are inherent in the system. Some of you were able to see more if you were fortunate enough to be chosen to support a human factors test being conducted by AMRL at Wright-Patterson AFB, Ohio. This test involved use of the only dynamic OAS simulator in operation today and, with your help, gave us some real operational feeling for the benefits from the OAS. Flight test began in September of this year at the Boeing Military Airplane Company, Wichita, Kansas. The test will be completed in September of 1981, at which time the first OAS-configured aircraft will be reaching the field. Conversion will be done on a wing-by-wing basis with Griffiss AFB receiving the first aircraft. We hope in subsequent articles to give you a "how goes it" update on flight test results and system capabilities, but in the meantime, sharpen your computer skills because OAS is coming your way.

BIG INSTRUMENT GO LOW

Captain James M Sullivan
1st Combat Evaluation Group
Barksdale Air Force Base, Louisiana

Last year, we wrote to you about some advantages of using low altitude instrument approach procedures. We noted that position orientation might well be easier, and that arrival clearances would be more exact when transitioning via an enroute descent using low procedures.

Airspace availability, FLIP, training, and our habit patterns have always suggested that a high altitude procedure was the easiest and most efficient means of bringing our aircraft safely back to terra firma. Well, the increased volume of air traffic and increasing fuel conservation efforts are subjecting that philosophy to closer scrutiny. In fact, there is every possibility that high altitude approach procedures may become a thing of the past.

As we pointed out in previous issues, the enroute descent is a highly efficient means of executing the initial arrival segment, terminating at a low altitude IAF. Therefore, a brief review of low altitude arrival procedures seems in order. AFM 51-37 and the Airman's Imformation Manual (AIM) are the source documents for our subject. They're both on the pilot's "best seller" list if you would like additional information.

The Procedure Turn

The procedure turn, depicted by a barb (⟶) in the plan view and a (⇌) symbol in the profile view (see Figure 2) is the most commonly published low procedure. While many of us haven't flown one for some time, the execution is quite simple if we think of it in terms of holding entry procedures.

As in holding, if the inbound procedure turn course is within 70° of your heading, turn outbound toward the maneuvering side and parallel the inbound course. If the inbound course is not within 70° of your heading, turn the shortest direction to parallel or intercept the inbound course. Should, however, the turn place you on the nonmaneuvering side (the side opposite the barb), and if your aircraft is maneuvering in excess of 180 KTAS, turn at least 20° toward the procedure turn course. In this case, if you intercept the procedure turn course outbound, maintain

FIGURE 1

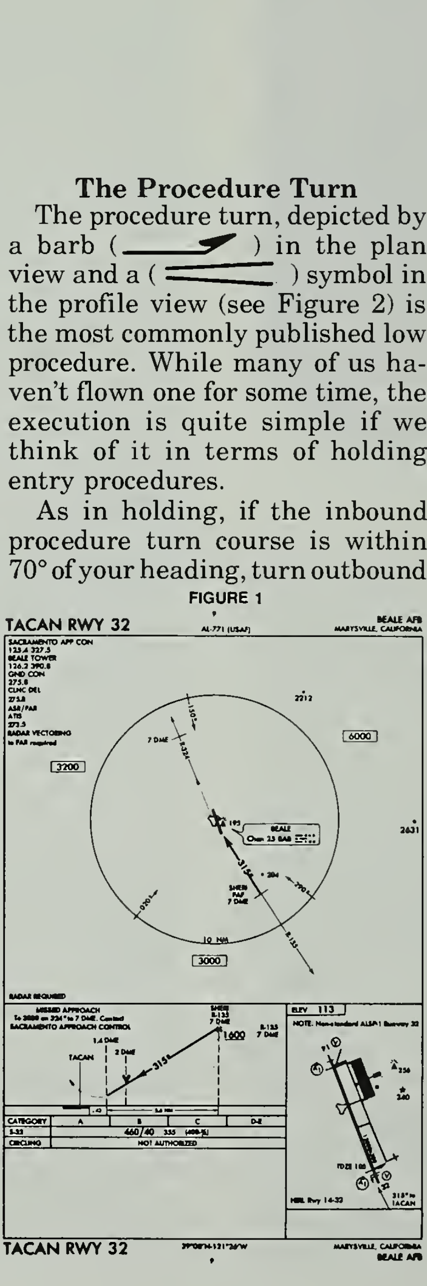
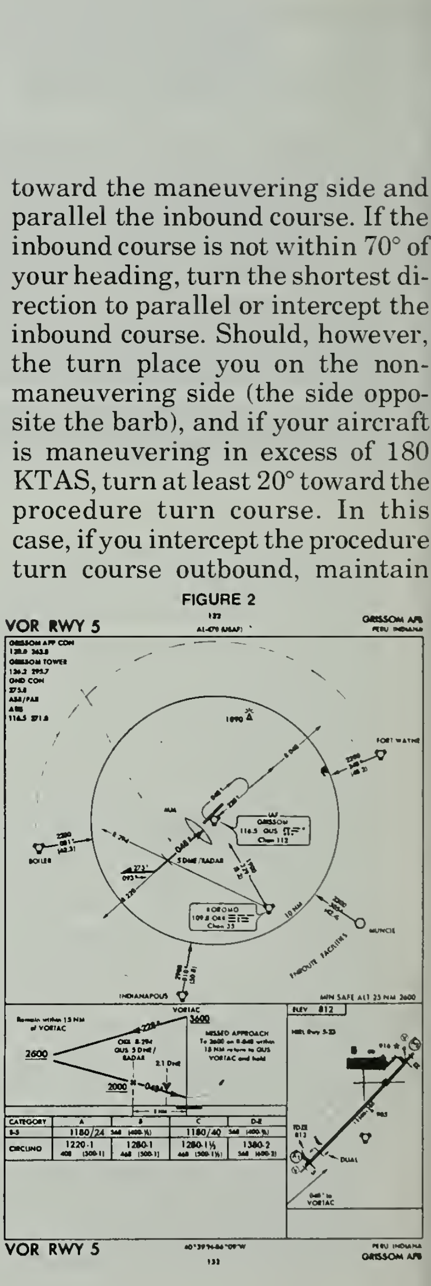


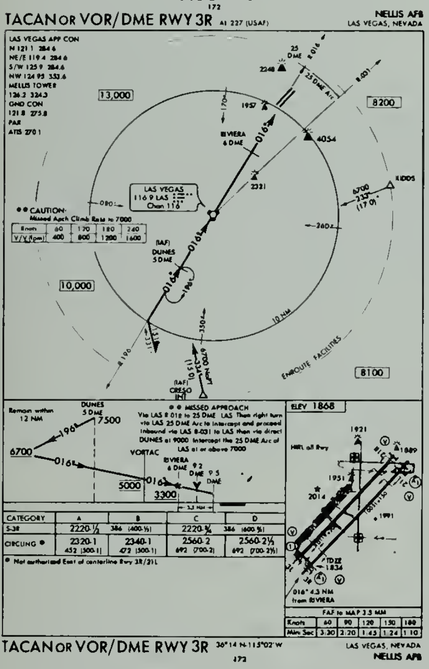
FIGURE 2



the course outbound and turn toward the maneuvering side at the termination of the outbound leg.

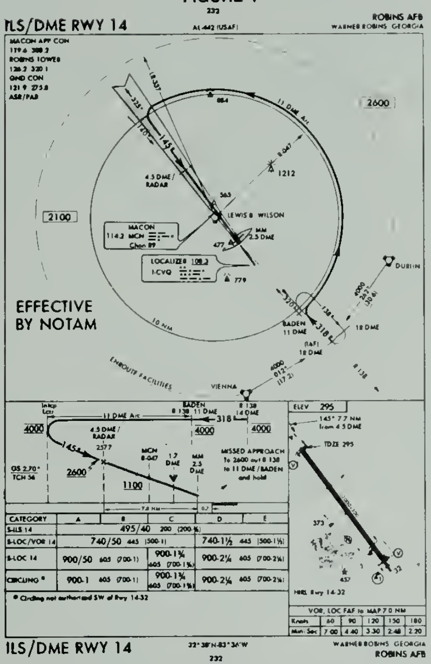
A tear drop procedure turn may be made if conveniently aligned. The procedure turn is accomplished by displacing the tear drop course 30° or less from the inbound course on the maneuvering side. As in holding, if outbound course guidance is available, maintain the selection tear drop course.

FIGURE 3



Most procedure turns will have a "remain within distance" published on the approach plate and the pilot should use whatever means available (timing, DME, radar) to comply. If timing is the method you are using, start timing when outbound abeam the procedure turn fix. This is also the point at which you should initiate descent from the procedure turn fix altitude. Further descent from the procedure turn altitude will be delayed until the aircraft is established on a published inbound segment.

FIGURE 4



There will be times when the turn or pattern will not be flown. Specifically:

(1) When issued on ATC clearance for a "straight-in" approach.

(2) When the initial approach is via a NoPT course (see Figure 3).

(3) When radar vectored to the final approach course.

(4) When conducting "timed approaches" from a holding fix.

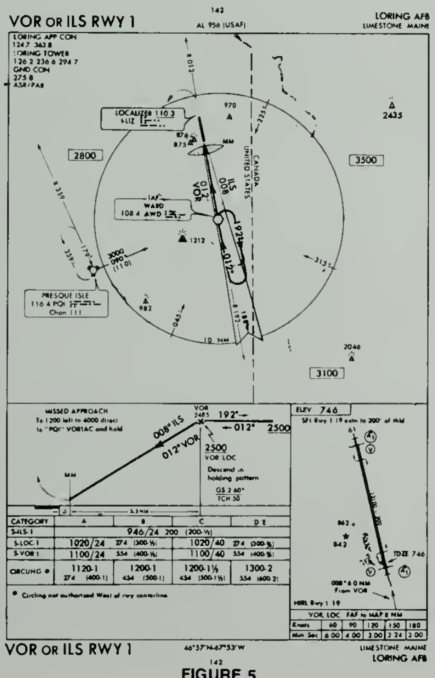


FIGURE 5

Holding-In-Lieu of Procedure Turn

Holding in lieu of a procedure turn is quite similar to normal holding in execution. The procedure will depict a holding pattern, (⊂═⊃) with a heavy blue line (see Figure 4) and normal holding entry and pattern procedures apply. The descent, however, may be depicted at the holding fix or on the inbound segment. In the latter case, the aircraft must be established on the inbound segment prior to descent. The entire procedure should be flown if approach clearance is given enroute to the holding fix. However, if clearance is received while *established* in the holding pattern, advise ATC of your intent to use one of the following options: fly the remainder of the published procedure; or proceed direct to the holding fix and complete the approach. (AFM 51-37)

Procedural Tracks

Procedural tracks are alternative maneuvers employing combinations of arcs, radials, DR tracks, courses, etc. While their depictions vary, the key element of their design requires the pilot to maintain the published *ground track* applying known drift and aircraft turn performance. (See Figure 5)

While some of the above procedures may seem confusing to those who haven't had the opportunity to fly many low altitude approaches, the old adage "Practice makes perfect" applies. As more low procedures incorporate minima for your category aircraft, it behooves us all to be familiar with the various approaches available to us. The CPS/WST is one way to get some hands-on practice, and thorough planning prior to flight has always been the best way to prepare for a safe arrival—high or low.

The FB-111 Goes Conventional

Major Lawrence Chalmer
509 BMW/DONO, Pease AFB
Photos by MSgt Paul J Harrington, AFAVS

On April 10, 1980, flying at a groundspeed of 480 knots 400 feet above the ground, an FB-111 flown by Captain Bill Kirkman-Pilot, and Lt Colonel Jim Eggers-Radar Navigator, released the first conventional weapon carried on an operational FB-111 mission. The radar release accomplished by Lt Colonel Eggers was both visually and optically camera scored as a "shack". The FB-111 had entered the world of the Iron Bomb. In this article I'll briefly describe the people and events involved in the FB-111 conventional validation program and the subsequent Rapid Deployment Force Red Flag exercise.

The conventional checkout of the FB-111 was, as are most endeavors, a "team" effort. But this "team," the team that deployed to Mt. Home AFB, Idaho, was unique. It was a team composed of men and women from two Wings and an Air Division - air crews, staff and maintenance personnel from the 380th BMW Plattsburgh AFB, N.Y., the 509 BMW, Pease AFB, N.H., and the 45 Air Division, Pease AFB. Colonel John Suther, 45 Air Division Deputy Commander for Operations was the deployed Detachment Commander. During the six day deployment, this team received weapons and load training from the 366th Fighter Weapons Instructor School, and the 366 Aircraft Generation Squadron, worked with the POMO Maintenance of Tactical Air Command, and flew from the 390 Tactical Fighter Squadron, Lt Colonel Joe Cabuk/Commander.

Hidrag MK 82 weapons delivered

I've said the team was unique. Perhaps I should better say, the concept for the FB-111 was unique. Working with TAC is not new—Red Flag is a continuing SAC tasking. A Pease-Plattsburgh working group is not new—FB-111 concerns are often worked jointly. What *was* new to us? What we found on the Mt. Home flight line was a concept of consolidated operations. A concept that considered crews, staff, maintenance personnel and aircraft as one pool of resources. No more yours or mine, no more this part goes in only this aircraft, no more union cards. I'm *not* saying the concept is new, or even the spirit I saw beaming from the faces of our maintenance workers when we launched a sortie. We've all seen that spirit before during Arc Light, Young Tiger, Bomb Comp, ORIs, or Global Shield. But to rally the men and women of two units so used to being competitors—to see them work so well together was strong tribute to personal professionalism. We weren't surprised. We were reassured.

The missions themselves were flown by four crews (see inset). After receiving TAC classroom briefings in ballistics, safe escape, fuzing and corollary topics, a hands on weapons preflight was run in the same hangar in which our MMS personnel received their wiring and load training.

A thorough afternoon of mission planning and target study occupied the crews' first afternoon as maintenance and load team members readied the FB-111s. Release altitudes varied from 200′-8100′ AGL. Runs were routinely accomplished at 480 knots, both by synchronous radar, visual, and computer aided visual release. Singles, pairs, and strings of Mark 82 inert weapons were released. The initial releases were photographed from a helicopter both by

Armored personnel carriers being struck

Colonel Suther and Lt Colonel Ohlson, 45 AD, and a team from the AF Audio Visual Service. All releases were accomplished at Sylor Creek Range, Idaho.

Five sorties were flown with each crew exercising one or more release methods. The releases were scored by the TOSS (Televised Optical Scoring System) crews of the 4440TFW as well as by the Saylor Creek Range Officers.

The test program achieved its goals. The FB-111 delivered conventional weapons on target using all release methods. It remained now to the crews to return to their Wings and train their fellow crews for the fast approaching Rapid Deployment Force Red Flag exercise 80-4.

4 June 1980, and RDF Red Flag 80-4, came quickly for each Wing. An intense training program of academics, hands on weapons preflight, and aircraft simulator training was rapidly completed. Each Pease crew was scheduled for runs against Nomans Land Island, a US Navy bombing range off the coast of Martha's Vineyard. Preparations for the June Red Flag were detailed, including the use of a mobility processing line at Pease for all participants and the use of Military Airlift Command aircraft for deploy/redeploy and crew exchange.

The 380th and 509th Bomb Wings had worked well together during the validation testing. Now, on a much larger scale, they would work together again—a total of over 100 people—flying from Mt. Home AFB, Idaho, a deployment of over 2500 miles for each Wing.

The 366 Tactical Fighter Wing, Colonel Von Christensen, Commander, was the host unit. Crews and staff worked from the 391st TAC Fighter Squadron, Lt Colonel Ernest R. Perkins, Commander. We have seldom seen such fine

FB-111 Conventional Validation Test Crews/Staff

380 BMW Plattsburgh AFB, N.Y.	509 BMW Pease AFB, N.H.
Major Michael Gould	Lt Colonel Eggers
Capt Leonard Deroche	Capt William Kirkman
Captain Richard Murrow	Captain Larry Jordon
Captain William Craig	Captain Gary Harvey

Colonel John Suther
45AD/DO — Dept Commander
Major John Marr
Maintenance Officer
MSgt John Dempsey
Maintenance NCOIC
Lt Colonel Nils Ohlson
Operations
Captain Lawrence Chalmer
Operations
Lt Colonel Normal Henrich
Weapons
Captain Norris Hanes
Weapons

Continued on page 26

CFIC Corner

the so-called "TRUE HEADING" nav leg

Captain William H Sudderth, Jr
CFIC KC-135 Brn Instr Nav
Castle AFB, CA

When was the last time you flew or thought about flying a "True Heading Nav Leg"? Simple, right? You just unslave the N-1 compass, set the present true heading and press. You don't have to worry about variation, convergence or anything else, right? Well, let's take a closer look at this so-called true heading nav leg and see just how simple it really is. The "true heading", or maybe an even better term to use would be "Directional Gyro", nav leg concept is a relatively simple process when you give it a little forethought. I'm sure you have heard many ways to fly "True Heading" nav legs, but we will discuss the way we at CFIC feel is the best way to fly true heading or D.G. From now on we will refer to true heading as directional gyro, or the D.G., nav leg.

First, you have to prepare your chart. We must establish a prime meridian (P.M.) and draw a series of parallel lines east or west of this P.M. (figure #1). These lines are used for heading reference and plotting. We must also compute the convergence angels (C.A.) for each of these parallels. You're probably asking why we use convergence angles, and next, how do we compute these angles. We must know our convergence factor so we can compute our convergence angle (C.A.) for the particular chart we are using. This C.A. is used when precomping for heading precomputed for use on our chart when we fly grid using the USAF grid overlay. To get these convergence figures for a D.G. nav leg merely take the C.F. printed at the bottom of the particular chart you use. Most likely it will be .63 or .78. Now, simply take the C.F. and multiply it times the number of longitude lines (figure 2). For example if you use 117W as the P.M. then 116W will have a C.A. of −.63 or −.73 and 118W will be +.63 or +.78. Simply assign the sign value to the direction you go, −East and +West. Now your chart should be ready.

But, what do we do in the air? We must run our grid checklist to enter a D.G. nav leg. We must determine our D.G. heading for our start nav point. We continue to follow our checklist by unslaving the N-1 and setting the latitude pointer within 4 degrees of actual aircraft latitude. Basically, unslaving of the gyro eliminates apparent precession and causes us to treat and apply any compass error as precession *not* deviation. In grid, how do we convert a mag heading into a grid heading? We use grivation, right? Well we must do the same on a D.G. nav leg, but let's call it Truvation which can be computed on mission planning day. The same formula from AFM 51-40 for grivation applies: Truvation $\times \underset{+E}{-\underline{W}}$ L.C.A. ($\underset{+E}{-\underline{W}}$ VAR) (Longitude Convergence Angle). Simply plug in the appropriate numbers and get your truvation (figure 3). This doesn't impact the out and back nav leg that much. It will however, have a major impact if you fly a D.G. nav leg from Castle

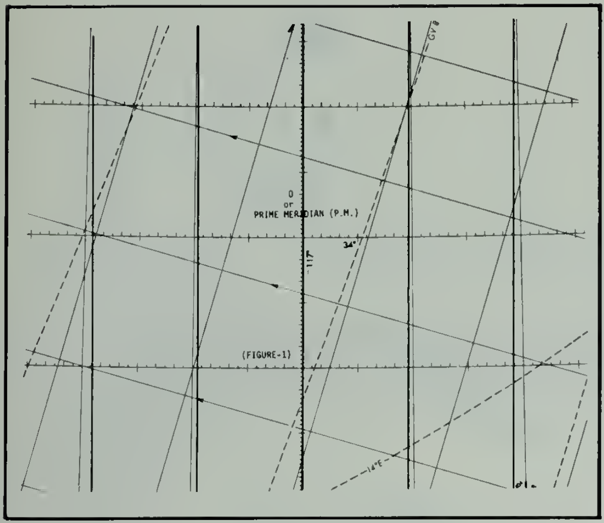


Figure 1

Figure 3

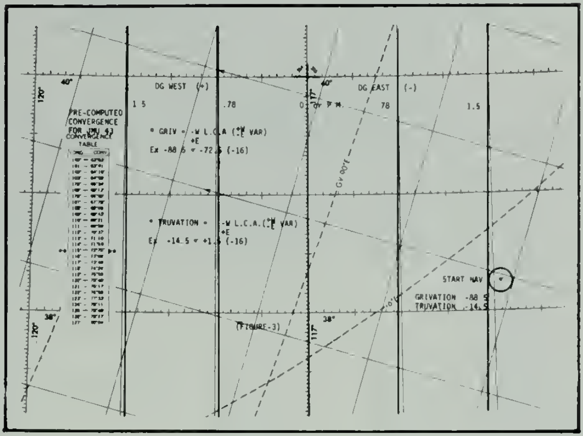
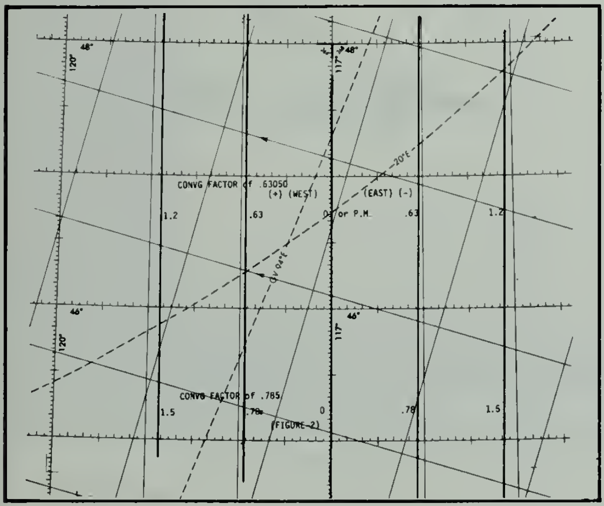


Figure 2



ASN-7/7A Coordinates:	N-1 Compass Mode:	Variation Data Input:
Geographic	Magnetic	AUTO
Grid	Directional Gyro	Zero degrees - W or E and manually set.
Grid	Magnetic	Grivation - W or E according to airplane position. Manually set and updated.
Geographic	Directional Gyro	Convergence - W or E according to airplane position. Manually set and updated.

(FIGURE -4)

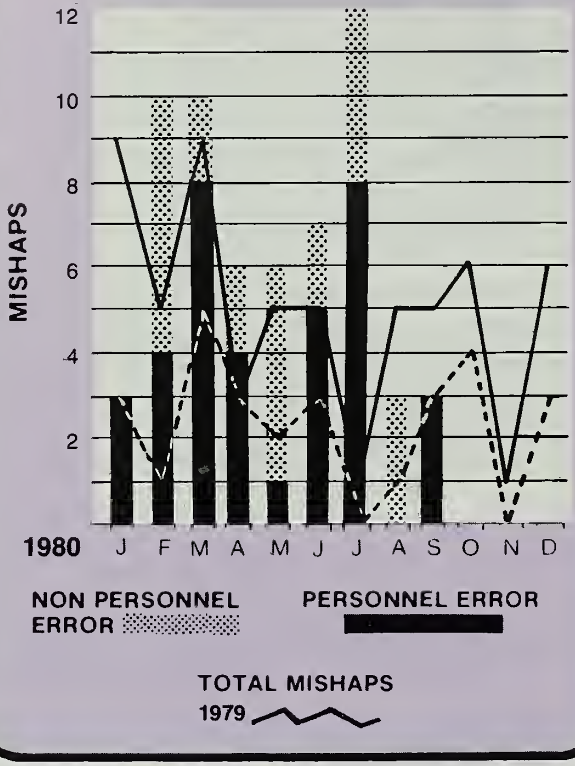
AFB, CA, to Pease AFB, NH, for example, by causing a large discrepancy between your initial N-1 true heading and you subsequent heading check.

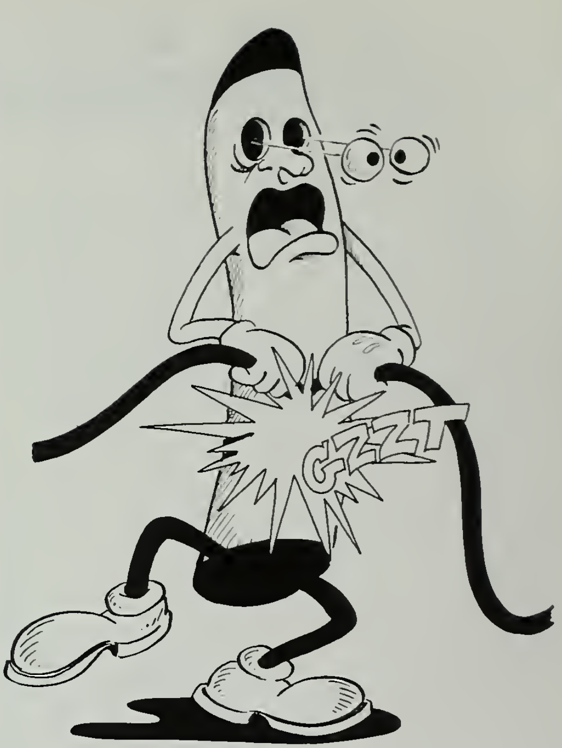
Now, what about heading checks and precomps for positions? They are done the same as on a grid nav leg. When you extract a true ZN from the Sight Reduction Tables (249), then we must convert this to a D.G.ZN by applying our convergence angle at the assumed position for the heading check or position. Remember "True Heading or D.G." is treated exactly like grid. As stated earlier, when you take a heading check and determine you have a compass error it is treated as precession and not deviation. This is because the N-1 is in the unslaved mode and precession must be compensated for. I can hear you KC types asking, "what about the ASN-7"? Do we zero the variation as in grid? No! Check your Dash-1, section IV for ASN-7 cross mode operation. It states with geographic coordinates and the N-1 in D.G. you must manually put convergence East or West in the variation window (figure 4). We are tricking the computer by flying D.G. and using geographical coordinates. The convergence compensates for the difference between the actual true heading and D.G. heading we are flying.

As you can see the true heading nav leg we think is so simple, really isn't that simple. To fly a successful D.G. nav leg it takes some forethought and a lot of pre-planning to adequately prepare yourself. Just remember when you consider flying a true heading nav leg, that all the preparation you have to do has already been done for you on the chart in the form of the standard USAF grid overlay. When you do decide to try a true heading nav leg don't hesitate to pick the brains of your unit's instructors if you have any questions or give us a call at 347-2235/2236, and we will be glad to answer any of your questions.

Missile Mishap Report

DOD CLASS A, B and C





AGM-69 POWER SUPPLY ELECTROLYTE LEAKAGE

An AGM-69 missile reported a communications No-Go during a systems interface test. The missile was removed from the launcher and was returned to the integrated maintenance facility for checkout. Upon disassembly, the components in the electronics shell displayed evidence of a heavy white powder residue. Also, the radar set computer safe/arming device and the connector of the GC&E were heavily corroded. The interior of raceway was covered with rust colored corrosion. Electrolyte leakage test results were positive but no sign of leakage or residue was found on the mating surface of the booster area of the electronic shell. No further disassembly or testing was undertaken pending instructions from depot as leakage and possible activation of battery occurred.

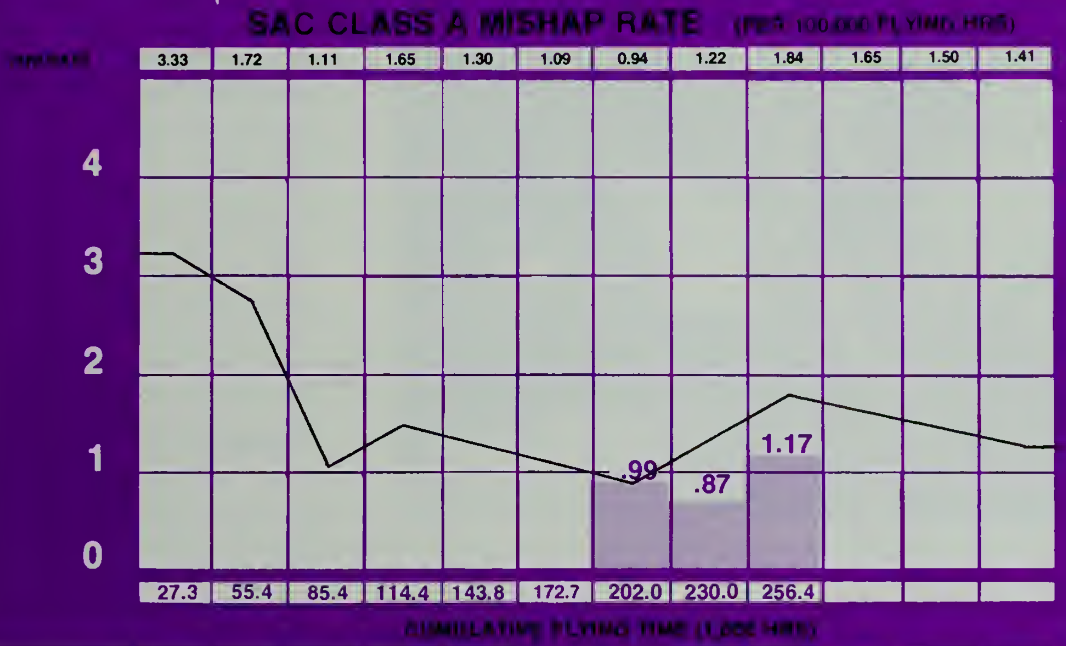
DIESEL FUEL SPILL

A facilities maintenance team member noticed the launch facility support building day tank low light was illuminated. Servicing procedures were begun when the day tank suddenly ruptured, spilling approximately 300 gallons of diesel fuel. Emergency procedures were implemented to clean up the spill. Findings and recommendations are under investigation.

OVER VOLTAGE DAMAGE

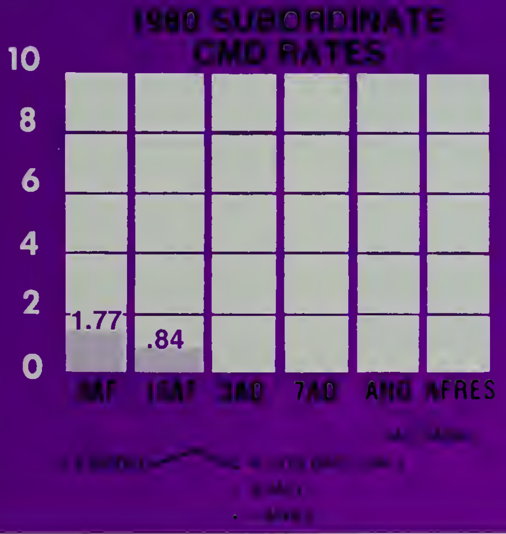
The compressor rotor on a guidance and control chiller unit locked up. The compressor rotor failure resulted in an excessive power demand from the motor generator. This caused the compressor circuit breaker to trip producing a surge (spike) of power to the remaining electrical components receiving power from the motor generator. This power surge damaged the A-3 module of the 6409A-3 and the A-1 transformer to the extent they required replacement. The findings of this mishap closely parallel the recommendations of the system engineering level evaluation and correction team (SELECT). Their recommendations were to perform an engineering feasibility study on modifying the 36 amp guidance and control power supply to withstand a greater input voltage and install a more sensitive circuit breaker to the chiller unit. One that has a faster tripping reaction when subject to over voltages.

1980 Flying Safety Rate



SAC CLASS A MISHAP RATE (PER 100,000 FLYING HRS)

MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1979	1	0	0	1	0	0	0	1	2	0	0	0
1980	0	0	0	0	0	0	2	0	1	1		



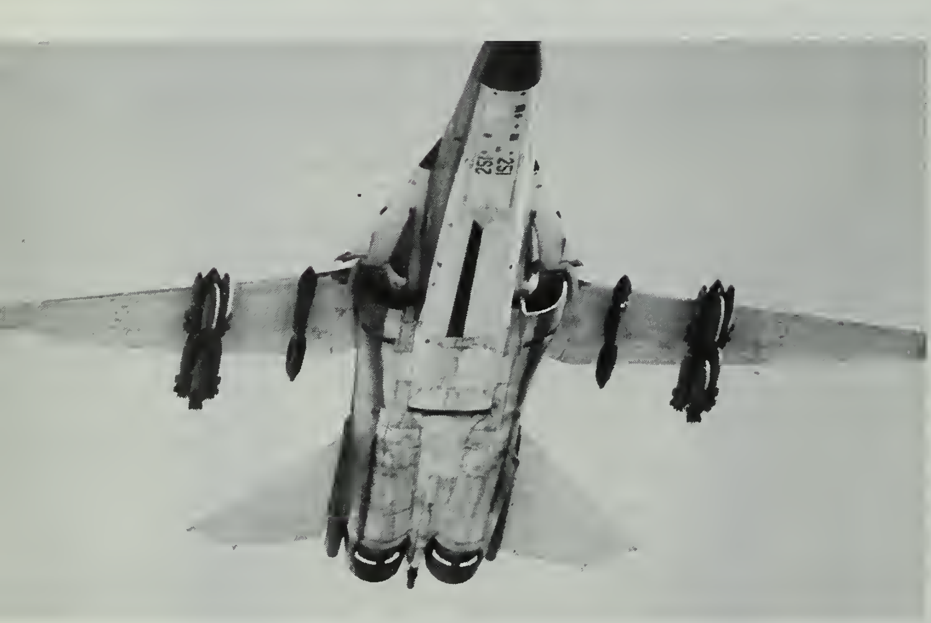
1980 SUBORDINATE CMD RATES

MISHAP STATUS

KC-135A	JULY 80
FB-111A	JULY 80
B-52	SEP 80
FB-111	OCT 80

The FB-111 Goes Conventional

Continued from Page 21



support as that offered us by these "Gunfighters". The FB crews and staff not only drew on TAC's expertise in F-111 conventional bombing, but were offered ballistic computer programs, and advice in tactic application and evaluation.

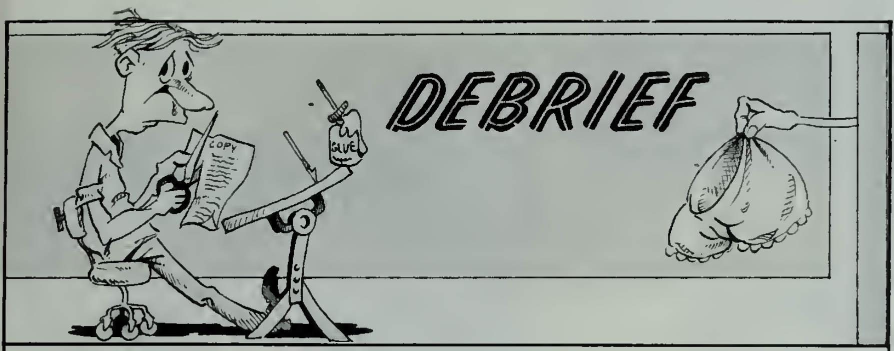
Each day's sorties were flown through a low level route (IR241) prior to entering Caliente Range and the Red Flag arena. The Air War as flown from Mt. Home added new realism to our Red Flag activity. Wing specific union cards were again thrown away. Crews flew available aircraft and were briefed by staff from either unit.

Red Flag missions have been well described previously in this publication. Conventional activity was new for the FB-111 and our deployed men and women found themselves preparing for, flying and debriefing sorties with unique considerations. Crews studied release ballistics while munitions personnel built, wired, and loaded MK 82 inert weapons. The Ops staff learned from TAC about the intricacies of deployed operations.

Colonel George Dietrich, Jr., 380 BMW/ADO, was the Deployed Detachment Commander and represented 45AD. The Operations staff came from each Wing and included Lt Colonel Robert Wielatz, 715 BMS/CC, Pease, and Lt Colonel Raymund O'Mara, 528 BMW/CC, Plattsburgh.

Maintenance activities were managed by Major Thomas Zavorskas, 380 BMW, Captain William Turner, 509 BMW, and MSgt John Dempsey, 380 BMW. Material items were supervised by 2Lt Marcia Taylor, 509 BMW.

The Bottom Line? The FB's learned a great deal—maintenance learned the conventionals business, our crews delivered iron on target, our supply managers learned to work the deployment problems, and all of us learned to work well together. This, naturally, was the best lesson of all. The FB-111 Wings await the challenge.



GIANT SWORD

To generate the desired competitive atmosphere at Giant Sword, it was essential the competition run smoothly. This effect was achieved through the hard work of the SAC competition staff and the men and women at Ellsworth AFB who hosted the competition. There were two stories to be told. One was written and the other was pictorial. Capt Jon Rosell headed up the public affairs effort for the second year in a row and his staff provided the SAC news releases each day. The other side of the story and probably the most lasting was told through the photos taken during the exercises. Every competitive event was covered by SSgt James Elia, SSgt Bill Jewell or SSgt Kevin Sorenson. A montage was made for each wing of their unit in action and covered all of their teams' competitive events. This photo essay will always provide memories of this 1980 competition.

DON'T BECOME A STATISTIC

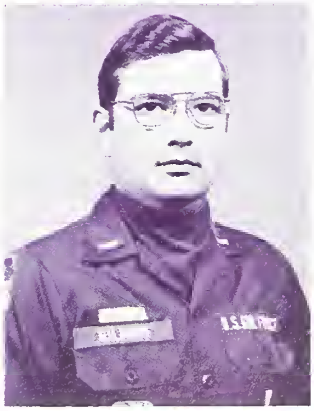
Continued from page 11

the sytem be written up in the 781. The actual tolerances are classified; however, an aircraft with any positive bias error (and random samples have shown that there are many) needs to be worked. Maintenance here at Castle tells us it takes a bare minimum of one hour to realign the Terrain Avoidance set with a more realistic estimate of four or five hours. Some problems take four or five days. So it's not a simple problem to correct, but it certainly is worth our efforts when the consequences are considered.

The experience gained from Red Flag and Maple Flag missions has fostered an increased emphasis on aggressive Terrain Avoidance flying. In fact, we may be lowering our Terrain Avoidance altitudes on our normal training routes in the near future. Consequently, more opportunities to fly lower and faster may be just around the corner. Can we make it with our present level of proficiency—certainly! And we'll get better; but, when flying at very low altitudes, radar altimeter errors, the Terrain Avoidance system errors, bank angle, and many other factors need to be given careful consideration. A recent B-52 mishap came within a few feet, or possibly inches from becoming a very sad mass of wreckage and bodies. We've learned from this and other mishaps. Hopefully, we've learned enough to prevent future problems from occurring. However, knowledge is only a part of it. Aggressiveness and flight discipline are another part. It's essential that they all go hand in hand in low level flight. The next time you are flying low level TA don't exceed your own limits, don't try to outdo someone else, don't exceed your equipment limitations and, above all, be careful and **don't become a statistic.**

PROFESSIONAL PERFORMERS

MINUTEMAN CREW



Crew R-062, 91 SMW, Minot AFB, including 1Lt Tommy L. Gilmore and 2Lt Stephen D. Coursey, is named Crew of the Month for timely handling of multiple emergency situations during a recent alert. While on alert the crew was notified that there would be a loss of status monitoring on four facilities. Lt Gilmore directed the team chief to halt maintenance and coordinated with job control. He determined that the maintenance team did not have the proper equipment. Shortly afterward, a maintenance team member seriously injured his leg and another team member became ill. The crew quickly accomplished crew contingency procedures, coordinating their actions with wing command post and a medical officer. They directed a wing evaluator in the flight area to transport the individuals to the hospital. While responding to this emergency, the flight security controller notified the crew that a team with an improper dispatch authorization was requesting entry. The appropriate security situation was declared and the crew began LCC isolation. During the isolation procedures, the emergency air conditioning failed to start. The crew corrected the problem to restore cooling air to the equipment racks. During this period, the LCC had been operating on diesel as part of a local exercise. After LCC isolation had been accomplished, the diesel failed and the capsule went to emergency power. The crew coordinated actions through another capsule and processed the required personnel into the launch control equipment building.

TITAN CREW

Crew R-130, 308 SMW, Little Rock AFB, is named Crew of the Month. Crewmembers are: Capt Ronald P. Hubbard, MCCC; 2Lt Elizabeth Langevin, DMCCC; Sgt Ricardo Berberena, MSAT, and A1C Paul M. Jolley, MFT. Their selection is based on superior crew and additional duty performance and noteworthy achievements in the area of ground, missile, and nuclear safety. The crew displayed exceptional professionalism and outstanding weapon system safety during their alert duties. Their superior talents were especially notable during two recent alert tours. While performing daily shift verification, the MCCC and MSAT discovered the motor starter contacts on water chiller 101 arcing severely. They immediately took proper action to deactivate the water chiller and safe the malfunctioning equipment. Their prompt actions prevented a fire and further damage to equipment. Secondly the crew discovered a dangerous rise in the launch duct temperature and stage I oxidizer pressure. Their investigation revealed that all cooling towers and water chillers had shut down. The crew performed timely malfunction analysis and corrective action which returned the cooling towers and water chillers to operation, thereby maintaining the readiness status of the missile sortie.

HEADS UP FLYING CLUB

Captain Frederick W. Chapman, Jr., 93rd BMW B-52 CCTS instructor pilot, Castle AFB, is selected for the Heads Up Flying Club.

During a standard CCTS training sortie in a B-52G, Capt Chapman and his students were flying multiple instrument approaches at Castle. With his student pilot in the left seat, just prior to turning base leg for an instrument approach, outboard engines one, seven and eight flamed out simultaneously. Captain Chapman immediately confirmed that he had fuel available to all engines. Suspecting fuel contamination, and with low RPM, he used emergency air start procedures. Using the ground start method, he opened the manifold and rotated the starters and engines. After restarting the engines, he placed all ignition switches on ON and monitored engine performance. On base leg he declared an emergency and requested immediate landing clearance. A normal eight-engine landing was accomplished; however, number eight engine flamed out again on the ground after the starters were turned off. Captain Chapman's suspicions of fuel contamination were confirmed after landing. Postflight inspection revealed that seven out of eight engine fuel strainers contained contaminated fuel. His immediate response and proper analysis of the situation were instrumental in the successful recovery of his aircraft and crew. His professional performance in a very demanding emergency situation reflects his superior air sense and flying skills. His outstanding judgment and airmanship saved a B-52 aircraft.

SAFETY NCO

MSgt Thadous J. Magwood, 91st Security Police Group, Minot AFB, is SAC Safety NCO of the Month. MSgt Magwood applied his knowledge of sports to develop a Group sports policy highlighting safety responsibilities of personnel involved in sporting activities. MSgt Magwood is constantly on the move throughout the Group, making safety checks, identifying hazards and problem areas, and providing recognition to personnel performing outstanding safety acts. A vital part of the Security Police Safety Team, MSgt Magwood works with unit safety NCOs in the three Security Police units to provide guidance to over one thousand security personnel at Minot AFB. His dedication, enthusiasm and professional approach to both his unit's safety program and that of the base has been outstanding and resulted in a zero reportable mishap rate so far this year.

MAINTENANCE MAN

MSgt Tommy R. Hicks, senior flightline chief, 376th OMS, Kadena AB, is Strategic Air Command Maintenance Airman of the Month. Prior to this assignment, Sgt Hicks was maintenance flight chief for the RC-135 fleet. He organized C Flight which was solely responsible for the RC-135s, while still maintaining the aircraft and meeting the daily flying schedule. He also established the MMICS work center and established an intensive training program for everyone in the new flight. He was then selected to reorganize the KC-135Q flight—B Flight. As the B Flight Chief, he established a 90% pass rate in completed maintenance evaluations under the maintenance standardization and evaluation program. Sgt Hicks' many contributions in all areas of maintenance make him a valuable member of the Strategic Air Command.

STAMP OUT COMPLACENCY

Capt Curtis M Schantz
321SMW, Grand Forks AFB

In the capsule, the crew noted a security alarm at one of their primary launch facilities and notified the flight security controller (FSC) to dispatch the armed response team (ART) to check out the situation. All concerned treated this as just another routine response probably caused by one of the northern tier "jack-a-lopes."

As the ART turned onto the access road to the site, the team leader spotted someone climbing over the site fence and departing the area. Now, a bit more alert, the team passed the information and pressed on. Suddenly a shot rang out, the ART took cover and radioed for additional help. No longer was this a routine response.

Two mobile fire teams, a second ART, and six civilian law enforcement officers responded to the scene. No other shots were fired and after completely sweeping the area, the team declared the site secure.

What was learned from this incident? Although three similar incidents of unauthorized personnel on site had been reported from other SAC bases in the previous two months, neither the ART nor the FSC were aware of these incidents. The missile combat crew vaguely remembered being briefed on these past situations. Obviously because of this lack of information, the level of expectation that this security alarm situtation might be more than routine had not been attained. With no reason to attach a particular significance to the alarm, everyone assumed that the alarm was routine. After all, who would ever attempt to penetrate a northern tier launch facility?

A serious case of complacency? You bet it was! Training emphasizes the passing on to the troops of lessons learned from previous nuclear related incidents. Even though frequent attempts are made at communicating the importance of being security aware in all areas revolving around nuclear safety, nuclear safety and security were treated as poor second cousins to the ultimate mission of the unit.

How can we stamp out this complacency? The answer is simple. We must get off our collective backsides and get out and sell the concept of nuclear surety. We must insure first line supervisors continually emphasize nuclear surety. We must convince everyone that their involvement is not only solicited, but is absolutely essential for an effective nuclear awareness. We must convince ourselves, and then the troops, that the safety slogans that say "You Are The Most Important Part of the Nuclear Safety Program" are, in fact, referring to each and every one of us. In short, we must get involved.

Safety and security, the definition of nuclear surety, is everyone's business. But, if the view in the field and in the office is that they apply only to the other guy, then our fancy slogan becomes just a joke. We don't need a Three Mile Island in the Air Force and if we are to continue to be successful in avoiding this, we must move on all fronts to **stamp out complacency.**

SAC SAFETY SCREEN

931 AREFG, Grissom Crew: P Capt Thomas J Knapik, CP Capt Melvin D Hattabaugh, NN Maj Robert L Bond, IS MSgt Jerry R Snyder
92 BMW, Fairchild Crew E-174: P Capt Kenneth A Mount, CP 1Lt Craig W Blankenstein, N Capt Patrick N Rosenow, BO TSgt Charles P Sheppard
28 BMW, Ellsworth Crew E-109: P Capt Robert J Finnegan Jr, CP 1Lt Mahlon L Dirks, IN Capt George H Wells, BO A1C Jeffery A Stewart
44 SMW, Ellsworth Crew R-103: MCCC 1Lt Claude C Braley, DMCCC 2Lt James J Eichelberger
321 SMW, Grand Forks Crew R-011: MCCC Capt Thomas E Jordan, DMCCC 2Lt Gerald W Kuchinsky
341 SMW, Malmstron Crew E-103: MCCC Capt Mark R Lehrman, DMCCC 2Lt Mark J Whetstone
351 SMW, Whiteman Crew E-161: MCCC 1Lt Michael R Schlegel, DMCCC 2Lt Gregory L Smith
390 SMW, Davis Monthan Crew S-162: MCCC 1Lt Steven E Kreuzkamp, DMCCC Capt Abigail L Herman, MSAT Amn John E Buzzard, MFT Sgt Julius Fitzpatrick
128 ARG, Gen Mitchell Fld: FP Maj Carl L Batton, CP Capt William G Herlihy, N Maj Arthur Thompson Jr, BO MSgt Herbert E Kieferndorf Jr
51 BMS, Seymour Johnson Crew E-05: FP Capt Jimmy C Mann, CP Capt Randall H McPeak, RN Capt George L Lane, NN 1Lt Robert D Montgomery, EW 1Lt Raymond K Schnabel, AG SSgt Charles M Denny Jr
911 AREFS, Seymour Johnson Crew E-117: IP Capt James W Bennett, CP Capt Kosta G Asselanis, IN 1Lt Michael W Skojec, BO A1C Mark S Carson
340 BMS, Blytheville Crew S-01: AC Capt Larry F Smith, CP Capt Patrick J Thomas, RN Capt Clemens E Uptmor, NN Capt Thomas D Brown Jr, EW Maj William J Noel, AG TSgt Lee M Cothran
340 BMS, Blytheville Crew S-05: AC Maj David A Brown Jr, CP Capt William J Fier, RN Capt Charles L Hite, NN 1Lt Johnnie R Madison, EW Capt Edward C Brasher Jr, AG SSgt Oval W Jones II
97 AREFS, Blytheville Crew R-117: AC Capt William T Snow, CP 1Lt Gert-Jan P Visser, NN Capt David A VanWinkle, BO SSgt Jeffrey L Boutwell
97 AREFS, Blytheville Crew E-123: AC Maj Gary T Grieshop, CP Capt Jack L Jordan, NN Capt Timothy D Kidwell, BO SSgt Anthony W Britt

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW AFR 127-2/SS1.*

*U.S. Government Printing Office
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